

REMARKS

Claims 16, 18, 22 and 24 to 26 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. Claims 16, 18, 22 and 24 to 26 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which application regards as the invention. Claims 16, 18, 22 and 24 to 26 were rejected under 35 U.S.C. §103(a) as being unpatentable over the admitted prior art (APA) in view of Mardon et al. (U.S. 5,735,978) alone or in combination with either one of Graham (U.S. 3,336,201) or Katz (U.S. 3,776,508).

Reconsideration of the application based on the following remarks is respectfully requested.

Withdrawn Claim

The Office Action asserts that claim 23 “does not read on the elected species and therefore withdrawn from consideration.”

Claim 23 has been amended to depend on claim 22, which was not withdrawn, and it is a further restriction on elected species F.

The applicant respectfully requests consideration of the amended claim 23.

In view of the arguments below, allowance of all withdrawn claims, all of which depend respectfully from asserted allowable claims is respectfully requested.

35 U.S.C. 112 Rejections

Claims 16, 18, 22 and 24 to 26 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement.

The Office Action asserts that there is neither adequate description nor enabling disclosure as to “ambient temperature,” as recited in claims 16 and 18.

However, it is respectfully submitted that ambient temperature is a well known and common term well understood by those of skill in the metallurgy field. For example, U.S. Patent 4,778,648, related to a nuclear fuel element claims “ambient temperature,” as do a large number of other patents in the metallurgy field. U.S. Patent Nos. 4,017,368, 4,383,853, 4,595,413, 4,604,148, 5,310,431, 5,618,502, 6,554,179 and 6,699,398, for example, all claim

and use the term “ambient temperature” in conjunction with similar technology. (These patents are submitted concurrently herewith via a Supplemental IDS, with the relevant claim language highlighted). It is respectfully submitted that one of skill in the art would have understand “ambient temperature” to be the surrounding fabrication environment temperature, as evidenced by the submitted and hundreds of other patents using the term ambient temperature. It is respectfully submitted that the term ambient temperature is sufficiently definite.

Withdrawal of the rejection of independent claims 16 and 25 and dependent claims 18, 22, 24 and 26 under 35 U.S.C. §112 is respectfully requested.

Claims 16, 18, 22 and 24 to 26 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which application regards as the invention.

The Office Action asserts “the claims are vague, indefinite and incomplete, and their metes and bounds cannot be determined because the temperature at which rolling is performed is defined in terms of an unknown ‘ambient temperature’.”

Again, it is respectfully submitted that one of skill in the art clearly understands “ambient temperature” as argued above, and as evidenced by a large number of issued patents in the field, the metes and bounds of “ambient temperature” would have been understood by one of skill in the art.

Withdrawal of the rejection of independent claims 16 and 25 and dependent claims 18, 22, 24 and 26 under 35 U.S.C. §112 is respectfully requested.

35 U.S.C. 103(a) Rejections

Claims 16, 18, 22 and 24 to 26 were rejected under 35 U.S.C. §103(a) as being unpatentable over the admitted prior art (APA) in view of Mardon et al. (U.S. 5,735,978) alone or in combination with either one of Graham (U.S. 3,336,201) or Katz (U.S. 3,776,508).

Mardon et al. discloses “a method of manufacturing a tube suitable for use as a sheath of a nuclear fuel rod zirconium based alloy.” “A drawn blank is subjected to successive passes of metallurgical treatment and of heat treatment.” (See Abstract).

Graham discloses “a method for extending the burn-up of nuclear fuel by first utilizing it in one type of reactor and then utilizing it further in another type of reactor.” (Col. 1, lines 9 to 13).

Katz discloses a “method of hydriding uranium-zirconium alloy by heating the alloy in a vacuum, introducing hydrogen and maintaining an elevated temperature until occurrence of the beta-delta phase transformation and isobarically cooling the composition.” (See Abstract).

Claim 16 recites “a method of fabricating a flat product of zirconium alloy, comprising:

one of preparing and casting a zirconium alloy ingot containing at least 95% by weight of zirconium, and including impurities and alloying elements;

shaping the ingot in order to obtain a flat arrangement;

subjecting the flat arrangement to a β quenching operation under conditions that are determined to obtain within the flat arrangement an acicular structure at an end of the β quenching;

subjecting the flat arrangement, after the β quenching, to a rolling operation performed in a single rolling sequence without intermediate annealing, the rolling performed at a temperature lying in a range ambient to 200°C, with a reduction ratio lying in a range 2% to 20%; and

subjecting the rolled flat arrangement to an annealing treatment in the α range or in out of an $\alpha + \beta$ range, performed in a temperature range 500°C to 800°C for 2 min to 10 h.”

APA admittedly does not show the “subjecting the flat arrangement, after the β quenching, to a rolling operation performed in a single rolling sequence without intermediate annealing, the rolling performed at a temperature lying in a range ambient to 200°C, with a reduction ratio lying in a range 2% to 20%,” and “subjecting the rolled flat arrangement to an annealing treatment in the α range or in out of an $\alpha + \beta$ range, performed in a temperature range 500°C to 800°C for 2 min to 10 h,” as recited in claim 16.

Mardon et al. clearly forms a tube blank before any annealing step (See Col. 2, line 50 and Col. 3, line 35, for example). Mardon et al. thus does not disclose “subjecting *the flat arrangement*, after the β quenching, to a rolling operation performed in a single rolling sequence without intermediate annealing, the rolling performed at a temperature lying in a

range ambient to 200°C, with a reduction ratio lying in a range 2% to 20%,” as recited in claim 16. Nor is any rolled flat arrangement subjected to an annealing treatment, as also claimed.

Mardon’s tube’s are drawn into blanks, and this different shaping process would not result in the same structure or in the claimed “reduction ratio” of 2 to 20 percent.

There simply is no teaching or disclosure in any of the prior art of a reduction ratio of 2 and 20 percent and this is not a mere obvious variant but a substantive claim limitation in the context of a specific claimed rolling operation. On this basis alone, withdrawal of the rejection is respectfully requested.

It also would not have been obvious to one of skill in the art to combine the references of Mardon et al. with Graham or Katz to achieve the claimed reduction ratio in view of the tube shaped structure. There also is no motivation or reason to combine Mardon et al. and Graham or Mardon et al. and Katz with the APA. Although it is known that different configurations are available for nuclear fuel elements, there are different ways to manufacture such pieces. Mardon et al. is a method for manufacturing tubes. Mardon et al.’s teachings are simply not relevant to the APA, regardless of the Graham or Katz teaching which do not address the APA steps.

With respect to claim 25, claim 25 recites, “a zirconium alloy flat product, obtained by the method:

one of preparing and casting a zirconium alloy ingot containing at least 95% by weight of zirconium, and including impurities and alloying elements;

shaping the ingot in order to obtain a flat arrangement;

subjecting the flat arrangement to a β quenching operation under conditions that are determined to obtain within the flat arrangement an acicular structure at an end of the β quenching;

subjecting the flat arrangement, after the β quenching, to a rolling operation performed in a single rolling sequence without intermediate annealing, the rolling performed at a temperature lying in a range ambient to 200°C, with a reduction ratio lying in a range 2% to 20%; and

subjecting the rolled flat arrangement to an annealing treatment in the α range or in out of an $\alpha + \beta$ range, performed in a temperature range 500°C to 800°C for 2 min to 10 h.”

As discussed above, the APA admittedly does not teach or show “subjecting the flat arrangement, after the β quenching, to a rolling operation performed in a single rolling sequence without intermediate annealing, the rolling performed at a temperature lying in a range ambient to 200°C, with a reduction ratio lying in a range 2% to 20%,” and “subjecting the rolled flat arrangement to an annealing treatment in the α range or in out of an $\alpha + \beta$ range, performed in a temperature range 500°C to 800°C for 2 min to 10 h,” as recited in claim 25. Mardon et al. does not disclose “subjecting the flat arrangement, after the β quenching, to a rolling operation performed in a single rolling sequence without intermediate annealing, the rolling performed at a temperature lying in a range ambient to 200°C, with a reduction ratio lying in a range 2% to 20%,” as recited in claim 25. Nor is any rolled flat arrangement subjected to an annealing treatment.

Withdrawal of the rejection of independent claims 16 and 25 and dependent claims 18, 22, 24 and 26 under 35 U.S.C. §103(a) is respectfully requested.

CONCLUSION

It is respectfully submitted that the application is in condition for allowance and applicants respectfully request such action.

If any additional fees are deemed to be due at this time, the Assistant Commissioner is authorized to charge payment of the same to Deposit Account No. 50-0552.

Respectfully submitted,

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